UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OFFICE OF THE
REGIONAL ADMINISTRATOR

June 21, 2004

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Re: Comments under the National Environmental Policy Act and the Clean Water Act Section 404 Review on the Final Environmental Impact Statement (FEIS) for the Interstate 93 Improvements Salem to Manchester, New Hampshire (CEQ Number 020405)

Dear Ms. Murray, Ms. Laffey and Ms. Godfrey:

The Environmental Protection Agency-New England Region (EPA) has reviewed the Federal Highway Administration's (FHWA)/New Hampshire Department of Transportation's (NHDOT) Final Environmental Impact Statement (FEIS) for the widening of Interstate 93 (I-93) for 19.8 miles from the Massachusetts/New Hampshire state line to Manchester, New Hampshire. We offer our comments pursuant to the National Environmental Policy Act (NEPA), Section 309 of the Clean Air Act, and Section 404 of the Clean Water Act.

As we have stated in the past, we appreciate the importance of the I-93 widening project to the State of New Hampshire. EPA's support for the goals of the project comes with a strong interest in making sure that the project design, operation and associated mitigation will serve transportation needs while protecting environmental and public health in the corridor. Moreover, we continue to support widening in tandem with suitable mitigation for the significant impacts the project will cause

and as part of a broad transportation strategy that includes improved transit opportunities. As you know, EPA has participated as a member of the "Board of Directors" (a cooperating inter-agency team) with the NHDOT and FHWA on the I-93 widening project to help identify important project issues and how they could be studied and addressed in a manner that would further streamline the environmental review process pursuant to Executive Order 13274. Our comments on the FEIS are intended to help NHDOT, FHWA, and the Corps better understand the issues and concerns we believe should be addressed prior to the close of the NEPA and Section 404 permit process.

Our comments on the DEIS focused on the potential for significant impacts to the aquatic environment, road salt, air quality and transit issues. Briefly, we noted that:

- impacts from the highway expansion, combined with other reasonably foreseeable impacts in the study area, will result in significant impacts to the aquatic environment, and need to be addressed to a greater extent than NHDOT has proposed;

- the risks that road salts would pose to sensitive aquatic species and water supplies in the project area were underestimated;

- insufficient information was available to determine the air quality impacts of the project alternatives;

- the FEIS should go beyond a commitment to study transit options in the corridor and provide a commitment to a firm schedule of implementation; and

- the FEIS should provide more specific information about NHDOT's facility investments and high-occupancy vehicle services that will be included in this project.

We appreciate the effort that NHDOT and FHWA made to address our concerns and those of other agencies and the public. Nevertheless, we continue to have concerns about some aspects of the project, as described below.

Wetland Impacts and Mitigation

The revised wetlands mitigation plan included in the FEIS is an improvement over that proposed in the DEIS. Specifically, we applaud NHDOT's commitment to protect sites in Musquash Swamp and to leverage the permanent protection of water supply lands through the addition of $3 million in funding for the Watershed Grants Program administered by the New Hampshire Department of Environmental Services (NHDES). Meanwhile, as stated in our letter of August 25, 2003 to Kathleen O. Laffey, Division Administrator, FHWA, we maintain that the size and quality of the mitigation package described in our comments on the DEIS is more appropriate for the impacts expected from this project, which we continue to believe will be significant. While NHDOT has expanded the mitigation plan, at this point we believe the project will still fall short of complying with the § 404(b)(1) guidelines because the effects associated with filling 77 acres of wetlands, combined with other reasonably foreseeable impacts to wetlands in the study area,

would cause or contribute to significant adverse impacts on the aquatic environment.

We appreciate your effort to add several sections on indirect and secondary impacts. However, the review and analysis of impacts other than the direct loss of wetlands where the road will be placed remains incomplete. For example, the issue of wildlife movement, which we raised as a concern in the DEIS, has not been addressed adequately in the FEIS. It does state that NHDOT will investigate the possibility of incorporating wildlife passages at four stream crossings when it completes final design. However, there is insufficient information to understand fully the magnitude of the loss and what actions will be taken during final design to help mitigate for this impact.

Many of the indirect impacts correlate strongly with the size of the highway, such as stream alteration and culvert length, patterns of runoff, salt use, and the spread of exotic species. For example, salt use is known to impact vernal pools hundreds of feet from a highway, yet the FEIS does not explore these types of impacts. Information on such impacts should be gathered when FHWA and NHDOT investigate the effects of salt use on water quality. (See below).

Statements in the DEIS and FEIS imply that the additional lanes and detention basins will improve water quality in the region. We do not agree. While proposed drainage swales and detention ponds will help reduce the amount of pollution coming from the highway before it reaches streams, the large amount of additional pavement will clearly add more pollutants, such as salt, to the aquatic environment and reduce natural recharge areas in the region. As the amount of traffic increases over time, with eventually twice as much traffic on the road as there is today, there will clearly be more–not less–pollution impacting water quality and the environment.

Future impacts likely to be induced by the project are as much of a concern as the direct and indirect effects. Once the road is in place it will be very difficult to monitor and manage future cumulative impacts to the aquatic environment. Much of the development will take place in small incremental amounts and some portion of that will likely impact the key natural resources of the region. Unfortunately, the bulk of the mitigation sites in the total plan are small, near development and isolated from other protected lands. Without a nucleus of important habitat blocks and travel corridors to ensure some modest biological connection, and protections for drinking water supply, populations of the more uncommon species and water quality will be compromised in the study area. EPA and many others commenting on the DEIS had proposed measures that would, through preservation of sensitive areas, avoid certain impacts and thereby reduce the potential for significant degradation of the aquatic environment. We urge NHDOT and FHWA to continue efforts to strengthen the proposed mitigation package to address these concerns and the significant impacts of the project. The final mitigation package should be included as a condition of any issued §404 permit.

Road Salt Impacts

We are concerned that the FEIS does not adequately describe the additional impacts to aquatic resources expected from significantly increasing the discharge of chloride associated with the proposed highway expansion. Further, the FEIS falls short in describing a plan to mitigate these impacts so that the project does not cause or contribute to violations of New Hampshire water quality standards.[1]

The DEIS concluded that, "*Under the No-Build Alternative, with the current deicing application rates, none of the streams are estimated to have average annual chloride concentrations above the aquatic life criteria of 230 mg/l for chloride.*" The DEIS also concluded that, "*Under the Four-Lane Alternative, ... none of the projected average annual chloride concentrations exceed the aquatic life standard and secondary drinking water standard of 230 and 250 mg/l, respectively.*" (DEIS pg. 4-39) These conclusions have subsequently been shown to be incorrect.[2] Over the past 18 months the NHDOT, NHDES and EPA have worked cooperatively to monitor existing chloride levels in streams, lakes, wetlands and the ground water aquifer within the project area. This work confirms that violations of New Hampshire water quality standards have occurred and are currently occurring at no fewer than nine locations, with some concentrations of chloride at very high levels, for extended durations.[3]

With regard to road salt impacts to ground water quality along the I-93 right-of-way, the FEIS concluded that chloride concentrations, even after 4-lane expansion has occurred, will not exceed secondary drinking water standards. Estimates were based on chloride levels in 30 wells sampled by the U. S. Geological Survey 17 years ago. Of these wells, the closest to the highway was approximately 1.6 miles away. Ground water samples collected earlier this month at two locations in the right-of-way contained chloride concentrations more than 52 and 47 percent greater than the 250 mg/l standard, and at levels already more than twice that predicted in the FEIS after expansion has occurred. Representative samples from wells installed at other locations along I-93 would provide important baseline information about actual chloride concentrations in ground water and drinking water resources.

These elevated levels of chloride are caused by numerous sources, including runoff from the existing lanes of I-93, other roads, private parking lots, improperly managed salt storage and handling facilities; and shallow well injections of public water supply filter backwash. The 2,500 tons per year of additional road salt application expected due to highway expansion will clearly contribute to existing water quality standards violations and likely cause additional

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[1]NH Code of Administrative Rules--Env-Ws 1700 Surface Water Quality Regulations.

[2]The DEIS relies upon an incorrect definition for water quality violations. Specifically, NHDOT used "average annual" instead of the 4-day average.

[3]See section on salt issues in the attachment to this letter.

violations beyond those identified to date. Further, these data and studies conducted by others[4] indicate a general upward trend in chloride levels from historic loadings from a variety of sources (including but not limited to the highway) within the project area. With an expanded highway, and the projected growth in population and development in the area, we expect this trend to continue and accelerate absent a comprehensive effort to address the increased discharge of chloride.

The regulations that implement Section 404 of the Clean Water Act prohibit the issuance of a § 404 permit if the activity being permitted would cause or contribute to a violation of any applicable state water quality standard. (40 C.F.R. § 230.10(b)(1)). In addition, pursuant to Section 401 of the Clean Water Act, no federal permit for a discharge to waters of the United States may be issued unless the state certifies (or waives certification) that the activity will comply with, among other things, state water quality standards. Based on current information, we believe that FHWA and NHDOT have failed to demonstrate that the highway expansion can comply with water quality standards and satisfy 40 C.F.R. § 230.10(b)(1). Although the FEIS suggests several actions that will be taken or considered to reduce the highway's increased contribution of chloride to aquatic resources (such as described in Section 4.4.1.5 of the FEIS), there is insufficient information available to quantify potential reductions, or to predict the impact of these measures on existing and likely future additional violations of water quality standards. Because the FEIS has not fully characterized the potential impacts from salt use associated with the project or determined whether a solution exists to resolve existing and potential water quality exceedances, we encourage the FHWA to commit in the ROD to further analysis of the salt related issues. This additional work on salt should occur before permit issuance, should include a mechanism for sharing this information with the public and could be used to fully inform decisions by the NHDES during the Section 401 Water Quality Certification process.

EPA recognizes the importance of highway safety and is fully aware that the existing I-93 highway and the proposed expansion are not the only significant contributors to chloride violations in the project area. Clearly, the other sources mentioned above also contribute to these violations. It is likely that sources in addition to the highway will be required to make significant reductions in their discharges of chloride in order for water quality standards to be achieved in a particular area. This issue also will need to be addressed when new or expanded discharges are proposed. However, as proposed, the I-93 expansion project will significantly increase pollutant loadings and it remains the responsibility of NHDOT and FHWA to assess the impacts to the aquatic environment and to propose adequate steps to avoid or mitigate these expected impacts.

Solving the salt problem will require additional study and is likely to require actions that will be taken over the long term and on a regional basis. We believe that the recent proposals by NHDES on how to proceed with the analysis and predictive modeling of this problem should be

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[4]Robinson, K. et al, 2003 Water-Quality Trends in New England Rivers during the 20th Century; U.S. Geological Survey, WRIR 03-4012, 20p.

undertaken by NHDOT and FHWA and committed to in the Record of Decision (ROD). In addition, there are some steps that can be taken immediately to reduce salt loading to waterbodies in the corridor, in addition to those actions that NHDOT proposes. A preliminary list of additional action items to reduce salt loading is provided in the attachment to this letter. We recommend that the ROD contain a commitment to undertake as many of these additional steps as possible. EPA stands ready to assist NHDOT, FHWA, NHDES and others in both the characterization of the chloride pollution problem, to help develop an appropriate scope for the effort, and in working with all users of chloride in the project area to resolve this problem.

Prior to issuance of the 404 permit, NHDOT must demonstrate that additional chloride loading from the proposed project would not cause or contribute to water quality standards violations. In all likelihood, this demonstration will require development of a plan that identifies specific, feasible measures to mitigate the impact of the increased loading from the expanded highway. In the event that such a demonstration is possible, the plan should be incorporated as a condition of any §404 permit issued by the Corps in order to ensure compliance with §230.10(b) of the Guidelines.

Secondary and Cumulative Impacts

As indicated in our comments on the DEIS, we commend NHDOT for using an Expert Panel/Delphi process for estimating the expected growth in population and jobs in the 29-town study area, and we believe this produced a reasonable and credible forecast. Although we appreciate the effort made by NHDOT to estimate the environmental impacts of this induced growth, we continue to believe that the amount of land that will be developed and the environmental impacts of this induced growth are underestimated and not adequately avoided and minimized, as described in our comments on the DEIS. In particular, we are concerned with impacts to wetlands, as described above. Nevertheless, we are pleased that NHDOT is committing to help address the impacts of this growth by providing $3.5 million for a Community Technical Assistance Program. If the Technical Assistance Program is successful it will be of great help to the towns in the New Hampshire portion of the study area in their planning and conservation efforts. EPA would be pleased to help with this effort through participation on the agency committee as well as through other assistance, as needed.

Transit

As we stated in our comments on the DEIS and as we discuss in the attachment to this letter, we believe NHDOT should go beyond an agreement to study transit options in the corridor and commit to a firm schedule of implementation. We are pleased that NHDOT recognizes the need for additional transit, as reflected in the statement on page 2-105 in the FEIS: "*...given the likelihood that rail service will be required to meet the long-range needs of transportation in the area served by I-93, it was proposed that space be reserved within the I-93 highway corridor for a possible future passenger rail line.*" Despite these good intentions, however, we are extremely concerned that efforts to study and implement this additional transit service lag seriously behind the current widening effort. We also are concerned about threats to the viability of at least one of

the transit options in the corridor, as discussed in the attachment to this letter. We strongly believe that any actions that preclude--or effectively preclude--implementation of transit options in the corridor should not be taken until the Transit Investment Study is completed and a preferred alternative selected.

We recommend that the ROD contain a commitment to begin the Transit Investment Study in 2004 and complete it by 2006, as described on page 2-112 of the FEIS, *and* a schedule for implementation of the preferred alternative that will ensure that service is available to the public no later than when the highway becomes as congested as it is today. In addition, we recommend that the ROD contain a commitment for reporting periodically to the public on progress towards implementing additional transit in the corridor. We also recommend that the ROD contain a commitment that no actions will be taken that would narrow the range of transit options in the corridor until the Transit Investment Study is completed.

Air Quality

Our comments on the DEIS requested specific information about commuter bus and high occupancy vehicle services that would be incorporated in the project. We are pleased that the FEIS provides such information and commits to implementing additional bus and high occupancy vehicle travel services prior to construction. This should encourage travelers to take advantage of alternatives when traveling in the corridor during construction, helping to reduce construction-related air pollution and traffic congestion. It will also encourage travelers to continue with high-occupancy vehicle travel when construction is complete. More detailed comments and recommendations on these services are provided in the attachment to this letter.

With respect to mitigation of construction impacts, we commend the measures that NHDOT will take to control fugitive dust emissions during construction. It is important to note, however, that the fine particle emissions from diesel construction equipment that will be used on the project are a serious public health problem. Given this, EPA requests FHWA to commit to require equivalent construction mitigation for the I-93 widening project in the ROD. Furthermore, EPA requests that NHDOT include contract specifications requiring construction vehicle retrofits and/or the use of cleaner fuels. Specific recommendations for construction mitigation are provided in the attachment to this letter. EPA is willing to assist NHDOT in developing and implementing these requirements.

Conclusions

EPA appreciates the importance of the I-93 widening project to the State of New Hampshire and NHDOT and FHWA's commitment to address the impacts of the widening. We look forward to supporting efforts by NHDOT and FHWA to resolve the concerns raised in this letter.

Thank you for the opportunity to provide comments on the FEIS. Please contact us as work occurs to address outstanding issues associated with the project. Please feel free to contact Carl DeLoi, Director of EPA New England's New Hampshire Unit (617-918-1581) if you have any questions about this letter.

Sincerely,

Robert W. Varney
Regional Administrator

Attachment

Additional Detailed Comments Attachment to June 21, 2004 letter from Robert W. Varney to Carol Murray, Kathleen Laffey and Christine Godfrey on the Final Environmental Impact Statement for Interstate 93 Improvements Salem to Manchester, New Hampshire

Salt Issues

Omissions

With regard to characterizing existing and future chloride impacts to surface water and ground water from I-93 expansion, the FEIS is incomplete. Important information from NHDOT/NHDES/EPA investigations over the last two years has been omitted. EPA is concerned that critical data necessary for the public to make an informed judgment about these impacts is not available in this document. Major omissions include:

1. EPA chloride data from 49 grab samples collected in streams and lakes from January 10, 2002 to May 9, 2003 and 72 grab samples collected from December 17, 2003 to April 16, 2004, or a total of 121 laboratory analyses. Chloride concentrations in these data range from 27 to 2,360 mg/l. This information is not included in Tables 3.4-1 and 4.4-3 of the FEIS.

2. EPA electronic datalogger data and graphs for Cohas Brook and Beaver Brook during the 2002-2003 winter season and Policy Brook and Porcupine Brook during the 2003-2004 winter season. These records show that the chronic (4-day or 96-hour) chloride standard in Policy Brook at the Salem Rest Area was exceeded during the entire month of February and most of March 2004, and the acute (one-hour) standard was exceeded for 26 hours in February 2004. The chronic standard in Porcupine Brook at South Policy Road was exceeded for 171 hours during the same period.

3. EPA synoptic data for specific conductivity at 21 locations in the Policy Brook and Porcupine Brook watersheds from June through November, 2003.

4. NHDES electronic datalogger data and graphs for Policy Brook and Spickett River during the 2002-2003 winter season.

5. NHDES biomonitoring results for fish and macro-invertebrate species, distribution, abundance, tolerance and impairment at six locations in the Policy Brook and Porcupine Brook watersheds conducted in September, 2003. Contrary to a statement on page 3-51 of the FEIS, no trout were detected by NHDES biomonitoring in these streams.

6. NHDOT electronic datalogger data and graphs for streams at six locations during the 2003-2004 winter season. These NHDOT records show that the chronic chloride standard for Beaver Brook, Dinsmore Brook, and Policy Brook was exceeded in early February 2004. Dinsmore Brook and Policy Brook also exceeded the acute standard as well.

7. Quantities of deicing salt used by the municipalities of Manchester, Londonderry, Derry,

Windham and Salem, NH in the Cohas Brook, Little Cohas Brook, Beaver Brook, Golden Brook and Spickett River watersheds.

8. Information on commercial/private deicing salt-storage practices and quantities in the study area.

9. Town of Salem ground-water data for residential wells tested during property sales and transfers. Since 1989, the Town has compiled records for over 800 well permits, many of which contain water quality reports (including sodium and chloride levels). Nearly all of these wells are located in the Spickett River, Policy Brook and Porcupine Brook watersheds. The well permit files could provide valuable information about existing aquifer water quality near streams and water supply wells in the I-93 corridor.

10. Characterization of chloride contamination and loadings to adjacent wetlands and Canobie Lake from I-93 and the Pennichuck Water Works W & E Community Wellfield on West Shore Road in Windham, NH. Chloride sampling and conductivity measurements since December 2002 in the wetlands draining into Canobie Lake next to the wellfield indicates levels that regularly exceed the 230 mg/l chronic standard. A preliminary analysis of chloride loadings to the wetland's watershed indicates that I-93 contributes approximately 57% (30.6 tons per year) of chloride to the wetland's watershed and the wellfield contributes approximately 43% (or 22.7 tons per year). I-93 loadings are based on an average application rate of 22.8 tons of salt per lane mile from 1992-2002 according to NHDOT records, and range from 13.26 to 29.65 tons per lane mile. EPA's estimate of 30.6 tons per year compares favorably with NHDOT's estimate of 31.51 tons (see Table 4.4-3 of the FEIS). Since road salt is approximately 60% chloride (or 13.7 tons per lane mile in this case) and I-93 has approximately 2.24 lane miles in the wetland's watershed, this results in the 30.6 tons of chloride per year average loading. When including I-93 in the entire Canobie Lake watershed, the 1992-2002 average annual loading is approximately 89.6 tons of chloride per year. This does not take into account unknown contributions from portions of the Exit 3 interchange, Routes 111 and 111A, or residential streets and parking lots in the rest of the lake's recharge area, which may be significant.

Wellfield chloride loadings are based on the average monthly salt consumption at the facility from August 2003 to March 2004, provided by Pennichuck Water Works. Average loadings amount to approximately 1.9 tons of chloride per month or 22.7 tons per year. Over that period, March had the greatest salt use: 10,800 pounds. Most, if not all, of the chloride injected at the wellfield probably flows into Canobie Lake, as the many residences supplied by the wellfield have septic systems that drain into the lake's watershed. Chloride levels in Canobie Lake are now nearly three times higher than they were in 1976.

Recent laboratory analysis indicates that extremely high concentrations of chloride in backwash waste effluent are injected in an Underground Injection Control (UIC) well approximately 80 feet from surrounding wetlands and 170 from Canobie Lake, the Class A water supply for the Town of Salem. Chloride in a sample extracted by EPA from the 10-foot deep UIC well on April 16th was analyzed by the EPA New England Regional Laboratory at 14,100 mg/l. The specific

conductivity (SC) of the sample was measured on site at 43,600 uS/cm. With the operator's permission, an electronic datalogger was installed in this UIC well for a period of five days (April 21-26, 2004). Conductivities during that period ranged from 7,605 to 47,553 uS/cm and averaged 42,268 uS/cm. Therefore, maximum chloride levels in the well likely exceeded the 14,100 mg/l concentration over that period by approximately 9% (or over 15,300 mg/l), based on the strong correlation between chloride and SC in this wastewater. The documented concentration of 14,100 mg/l represents more than 61 times the NH regulated level in surface water (230 mg/l) and more than 56 times that of the secondary drinking water standard (250 mg/l).

11. Chloride impacts in the FEIS are presented largely as averaged conditions based on NHDOT 2002-2003 data. See Tables 3.4-1 and 4.4-3. The fundamental error in FHWA's and NHDOT's analysis is their use of an inappropriate averaging period for applying the chronic chloride criterion. The FEIS refers to "average annual chloride concentrations" whereas the averaging period associated with EPA's criteria guidance is "the 4-day average concentration of chloride, when associated with sodium, does not exceed 230 mg/l more than once every three years, on the average." [Ref. USEPA, February 1988, *Ambient Water Quality Criteria for Chloride 1988:* Office of Water Regulations and Standards, Criteria and Standards Division, Washington, DC, EPA 440/5-88-001, p. 8]. New Hampshire has adopted EPA's criteria into its Surface Water Quality Standards Regulations (Chapter 1700). By a memorandum dated June 18, 2003 from Paul Piszczek to Paul Currier, Administrator, NHDES Watershed Management Bureau, NHDES confirmed that it applies the chronic chloride criterion using this averaging period. This averaging period is much more stringent than what was used in the FEIS, and its exceedence can be supported with electronic datalogger, statistical regression and chloride sampling analyses.

12. Page 4-37 also states that NHDOT's seasonal road salt usage in 2002-2003 on I-93 was 28.2 tons per lane-mile, as compared to the ten-year average of 22.8 tons per lane-mile, and therefore the "observed data in this study should reflect higher than normal chloride and specific conductance levels, where road salt applied to I-93 is a major contributing factor." However, the usage during the 2003-2004 season was below average at 21.4 tons per lane-mile (William Arcieri personal communication, 6/3/04), but chloride levels in some streams (such as Policy Brook at the Salem Rest Area and Beaver Brook) were considerably higher this past winter compared to the previous winter. This finding suggests that surface water chloride predictions based solely on NHDOT salt usage data (see Table 4.4-3 on page 4-49) may be highly limited in value (if not inaccurate). It is likely that other factors such as precipitation and temperature patterns, ice thickness, ground-water baseflow concentrations, septage, and municipal/commercial salt usage, play a large part. The FEIS acknowledges this on page 4-61 in its TMDL section, where it states: "I-93 is not the primary contributor to elevated chloride levels in many locations."

13. The last sentence of page 4-48 states "Additional continuous specific conductance levels measured by USEPA and NHDES every 15 minutes throughout the winter indicate the peak chloride concentrations never exceeded the acute criteria of 860 mg/l in the sampled streams." While this may be true for the winter of 2002-2003, the FEIS does not report that the acute one-

hour standard was exceeded twice in Dinsmore Brook (NHDOT data) and for 26 hours in Policy Brook at the Salem Rest Area (EPA data) during the winter of 2003-2004.

14. Table 4.4-3 presents a summary of observed and estimated average chloride concentrations in 22 streams for the no-action and four-lane build alternatives. As stated above, such predictions may have limited value, and are based on simplistic mass-balance assumptions that ignores the legal definition of chloride toxicity and other contributing factors. If FHWA/NHDOT applied a numerical model that incorporated these factors combined with a Monte Carlo statistical package, they could reasonably calculate the probabilities of chronic 4-day and acute 1-hour exceedances for each stream under maximum historical salt usage loadings (29.65 tons per lane mile). Average chloride concentrations are not as important as the analysis that is needed of the magnitude and duration of chloride concentrations that can be toxic to fish and macroinvertebrates or otherwise degrade the environment on which they depend.

15. Total Maximum Daily Load and Training/Outreach sections on pages 4-61 and 4-62: EPA applauds the willingness of FHWA/NHDOT to actively participate in water quality monitoring and data development for future TMDL modeling and to conduct an active outreach program to educate local communities about salt's environmental impacts and assist with NPDES II MS4 implementation.

16. Table 4.4-8 on page 4-81 shows estimated chloride concentrations in ground water at the edge of the I-93 right-of-way under existing and future conditions of highway expansion. Predicted concentrations range from 16.6 to 149 mg/l of chloride. This table is not supported by in situ monitoring data, and greatly underestimates actual ground-water conditions in at least two locations, one south of Exit 2 and the other south of Exit 1. Existing chloride levels at these locations are already more than twice that predicted to occur under the future four-lane alternative. We note:

Monitoring Well 5D was installed on November 13, 2002 by ENSR International of Westford, MA as part of VOC characterization and mitigation at Ground Water Management Permit Site DES #198405027 for 19-23 Keewaydin Drive, now owned by Brooks Properties, Inc. of Salem, NH. It is located 32 feet east of the northbound lane of I-93 just south of Exit 2. MW-5D is 51.5 feet deep, and penetrates 13 feet of fine to coarse sand and 37 feet of competent bedrock. Based on water-table mapping conducted by ENSR, ground water flows from the WNW to the ESE. The monitoring well was sampled for sodium and chloride after obtaining permission from the owner.

EPA field measurements made on June 1, 2004:
Depth to water below top of casing (TOC) = 9.08 feet
Depth to water below ground surface = 6.30 feet
Depth to well bottom below ground surface = 51.47 feet
Stickup: TOC is 2.78 feet above ground surface

The well was purged until stabilization within 5 percent occurred in specific conductivity,

salinity and temperature levels. Two 0.125- liter duplicate samples were collected with a 1.5-inch diameter teflon bailer following well purging, placed on ice and were delivered to the EPA Regional Laboratory in Chelmsford, MA on June 4, 2004 for sodium and chloride analyses.
Temperature of sample = 9.90 degrees Celsius
Specific conductivity = 1,246 uS/cm
Salinity = 0.6 parts per thousand
Chloride = 368 mg/l (EPA Regional Laboratory analysis)
Sodium = 96 mg/l (EPA Regional Laboratory analysis)

The second location is a 24-inch diameter cement culvert that discharges to Policy Brook. This culvert is 48 feet east of the edge of pavement of the northbound lane and approximately 750 NW of the Salem Rest Area on-ramp bridge over Policy Brook. Its flow consists of shallow ground water and wet-weather storm water collected by a complex of subsurface drainage channels constructed beneath I-93 and the Exit 1 interchange in 1962. Its flow is perennially clear, cool and high in chloride. EPA specific conductivity measurements are: December 17, 2003: SC = 1,357 uS/cm; February 6, 2004: SC = 1,264 uS/cm; February 27, 2004: 1,440 uS/cm, Chloride = 425 mg/l; March 11, 2004: 1,325 uS/cm; and March 26, 2004: SC = 1,858 uS/cm; June 4, 2004: SC = 1,325 uS/cm, Chloride 381 mg/l, Sodium = 187 mg/l (EPA Regional Laboratory analyses).

Action items to reduce salt loading

As mentioned in the FEIS and as documented in data collected by NHDOT, NHDES, and EPA over the past two winters, there have been numerous violations of state water quality standards for chloride in streams described above in the I-93 corridor. EPA recognizes that DOT is proposing to undertake several actions to address this problem, although we do not believe the actions will be sufficient to enable the highway expansion to avoid causing or contributing to a violation of water quality standards. Moreover, we are concerned about the ongoing violations of the chloride criteria caused by chloride contributions from the existing highway and numerous other sources. Therefore, we recommend that NHDOT work with NHDES and the corridor communities to address existing violations of state regulations. The goal of these actions should be to reduce chloride concentrations to below 230 mg/l in streams and to below 250 mg/l in drinking water:

- **Education:** NHDOT and NHDES should work with the corridor communities in the region to help local officials such as Boards of Selectmen and Departments of Public Works understand how they are contributing to chloride contamination of water resources within and outside their jurisdiction. Local ordinances and bylaws governing salt application and storage should be developed and enforced at both the local and, if necessary, the state levels. Incentives for compliance should be developed and for those cases where incentives don't work, conservation agents should be given the power to enforce these bylaws in their towns. Newspaper articles, town meetings, and local cable programs can be used to communicate with the public about this issue and the actions that must be taken to protect the ecological integrity of their streams and the quality of their drinking water.

- **Salt storage:** NHDOT and NHDES should work with the corridor communities to help them clean up their Public Works maintenance facilities, such as that owned by Salem on Cross Road. As an example of the problem encountered at such maintenance facilities, EPA observed salt-rich contaminated runoff from the Salem site to be flowing unimpeded into Policy Brook, an impaired stream. A number of practices will reduce the discharge of salt from such facilities, including requiring all vehicle washing to be conducted in a closed facility, and all wash water collected in tanks for proper offsite disposal.

  NHDOT and NHDES should work with communities to eliminate uncovered, poorly managed salt piles on all commercial properties. While monitoring water quality in the watershed over the past two winters, EPA scientists observed a number of such salt piles in commercial parking lots. In one case the salt was dumped in a pile next to the bank of the Spickett River and during spring rain, salt flowed unimpeded in large quantities straight into the river. Other piles flowed into adjacent catch basins and into streams. These practices are in direct violation of the New Hampshire Comprehensive Shoreline Protection Act, and should be addressed by the property owners and communities, with the assistance of NHDOT and NHDES.

- **Salt application:** NHDOT should work with their own personnel as well as those of the corridor communities to minimize road salt application using the Best Management Practices proposed by NHDES in the draft water quality certification. Many of these practices can be put into use before next winter. We are pleased to see a discussion of Road Weather Information Systems, use of "pre-wetting" techniques, and other practices in the FEIS, and believe that NHDOT can be even more aggressive in use of such techniques that minimize the amount of road salt needed while still maintaining road safety.

- **Water treatment and brine discharge:** NHDES should work with water suppliers to eliminate the direct injection of waste brine into ground water at all public water supplies. NHDES estimates there are about five of these ground-water injection sites in the area. An example is the W&E wellfield backwash injection well. Owned and operated by Pennichuck Water Works, this well is located just 80 feet from wetlands and 170 feet from Canobie Lake, a Class A public water supply. This facility is allowed to inject into the ground 1,000 gallons of waste brine per day, containing 14,100 mg/l chloride. This concentration is 61 times the state standard and 56 times the drinking water standard. This injection is polluting the wetland and contributing to an increase of chloride in the lake. At a minimum, all backwash waste should be stored in holding tanks for proper offsite disposal.

Transit

The bus service that will be implemented in the corridor, as described in the FEIS, is a good first step, but the FEIS shows this will not be enough. As shown in Table 2.3-6, in the year 2020,

even with 4 lanes in each direction plus bus service, Levels of Service (LOS) on I-93 will be just as bad as they were in 1997. That is, it will be LOS D or E south of Exit 3, and LOS C from Exit 3 north. If those Levels of Service are seen as unacceptable today, they are likely to viewed the same way in the future. The only solutions we are aware of are either: 1) to widen the road again, an action that NHDOT has stated that it has no intention of implementing and is contrary to NHDOT's general guidelines of not constructing highways with more than eight basic lanes, as described on page 2-100, or 2) to provide additional transit service.

As you know, EPA agreed with NHDOT's proposal to drop rail as a stand-alone alternative in the DEIS so long as there was a binding commitment to conduct the bi-state transit study *and* to work to implement the preferred transit system alternative in a timely way. We are concerned that little, if any, progress has been made on either of these issues. When the DEIS was published in September 2002, NHDOT indicated they were working with the Massachusetts Executive Office of Transportation and Construction (Mass EOTC) to develop a scope of work and process by which a bi-state transit study would be conducted, and that it planned to begin the study in 2003. That study has not yet begun. In addition, we are not aware of any binding commitments having been signed between NHDOT and Mass EOTC, or with the resource agencies on the I-93 "Board of Directors," as agreed at meetings in 2001. Although we are pleased that federal funding became available this fiscal year and that NHDOT continues to work with Massachusetts on a scope of work and consultant selection, we are very concerned that nearly two years have passed since publication of the DEIS and little has been accomplished. As indicated earlier, we recommend that the ROD contain a commitment to conducting the Transit Investment Study and to implementing the preferred alternative in a timely manner.

Finally, we believe it is important that all reasonable options for transit service in the corridor be preserved until the Transit Investment Study has been completed and a preferred option selected. We are therefore very concerned to learn that one of the options may be in jeopardy before the study even starts. We have two concerns. First, we understand that the state is not acting to purchase a portion of the Manchester and Lawrence line in Salem that Guilford Transportation Industries is seeking to sell. This section of railroad is critical to rail service in East Rail Corridor, which is one of the rail alternatives described in the FEIS, and that should be further evaluated in the Transit Investment Study. If the state does not purchase the line now and it is sold for private development, it all but precludes the reactivation of service on this line since it would be exceedingly costly for the state to purchase the land in the future. Not purchasing the line now, when the state has right of first refusal, may not foreclose the East Rail Corridor option in a legal sense, but we are concerned that it essentially does so in a practical sense.

Our second concern relates to the proposed bicycle path. We agree with the recommendation that the bicycle path layout along I-93, as described in the DEIS, not be used, and that an alternative layout be pursued and implemented. Although we strongly support bikeways and NHDOT's commitment in the FEIS to work with regional and local officials to implement the Bikeway Feasibility Study recommendations, we are concerned with the Study's recommendation that the pedestrian and bicycle travel be located along the abandoned Manchester-Lawrence railroad corridor. If that alignment would pose an impediment to using that rail line for future rail service

between Boston and Manchester, we strongly recommend that NHDOT defer implementing the recommendations of the Bikeway Feasibility Study until the Transit Investment Study is completed and a preferred alternative selected. We recognize that building a bike path on a rail bed does not mean that it cannot be converted back to rail in the future. However, we also recognize that once funds have been invested in constructing a trail and once people are using it, it would be extremely difficult to convert the bike path to other uses. As to whether it may be possible to run a bicycle and pedestrian trail next to an active rail line if safety issues can be addressed, we are not sufficiently familiar with the specific characteristics of the Manchester-Lawrence railroad corridor to know whether that would be feasible here. We recommend that the ROD contain a commitment that no actions will be taken that would narrow the range of transit options in the corridor until the Transit Investment Study is completed.

Air Quality

Commuter Bus Service and Park and Ride Facilities

Our comments on the DEIS requested more specific information about commuter bus and high occupancy vehicle services that would be incorporated in the project. We are pleased that the FEIS indicates a specific number of parking spaces to be provided at Exits 2 (430), 3 (525), and 5 (approximately 500). The FEIS also presents a strategy for increased transit services during construction including the purchase of additional buses for expanded bus service and the implementation of marketing and incentive programs to encourage commuters to take advantage of these services. We recommend that NHDOT purchase the cleanest buses available, buses equipped with diesel particulate matter filters fueled by ultra-low sulfur diesel fuel.

We are also pleased that NHDOT will construct the expanded park and ride facilities and introduce expanded commuter bus service in advance of construction. This should encourage commuters and others to take advantage of available alternatives when traveling in the corridor during construction, helping to reduce construction related air pollution and traffic congestion. It will also encourage commuters and others to continue with high-occupancy vehicle travel when construction is complete.

We strongly encourage the NHDOT to continue to work with MPOs, TMAs and others to pursue different types of incentive programs to encourage high-occupancy vehicle travel--carpools, vanpools and commuter bus service--along this corridor. EPA will assist NHDOT in these efforts through ongoing transportation planning programs.

Construction Mitigation

We commend the measures that NHDOT will take to control fugitive dust emissions during construction. These measures include applying water to roads, cleaning paved roads, and scheduling construction to minimize the amount and duration of exposed earth. It is important to note, however, that the fine particle emissions from the diesel construction equipment that will be used on the project are a serious public health problem, especially in the areas immediately adjacent to where they are released. They pose a significant health risk because they can pass through the nose and throat and lodge themselves in the lungs. These fine particles can then cause

lung damage and even premature death. Moreover, EPA has characterized diesel exhaust as a likely carcinogen.

Given these public health concerns, EPA strongly recommends that measures be implemented to reduce fine particle emissions from diesel exhaust associated with I-93 construction. We recommend that NHDOT include requirements for diesel retrofits and/or the use of cleaner diesel fuel in their construction contracts for this project. The inclusion of these requirements in contracts for a project of this magnitude would help reduce construction related impacts on adjacent communities.

Similar requirements have also been included in the contracts by the Connecticut Department of Transportation (ConnDOT) for its Connecticut Clean Air Construction Initiative on the I-95 New Haven Harbor Crossing Corridor Improvement Program in New Haven. Briefly summarized, the ConnDOT program requires all contractors and sub-contractors with diesel-powered construction equipment with engine horsepower (HP) ratings of 60 HP and above, that are on the project or assigned to the contract in excess of 30 days are required to have emission control devices (such as oxidation catalysts installed on the exhaust of the diesel engine) and/or use clean fuels (such as PuriNOx). In addition, vehicle idling is generally limited to three minutes for delivery and dump trucks and other diesel-powered equipment. The Massachusetts Highway Department and the Massachusetts Bay Transportation Authority (MBTA) also now include similar retrofit requirements in all of their construction contracts.

EPA requests FHWA to commit to require equivalent construction mitigation for the I-93 widening project in the ROD. Furthermore, EPA requests that NHDOT include contract specifications requiring construction vehicle retrofits and/or the use of cleaner fuels. EPA is willing to assist NHDOT in developing and implementing these requirements.